2.

INTRODUCTION
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The term 'Biodiversity'- a contraction of 'Biological Diversity' was introduced in the mid 1980's by naturalists who were worried about the rapid destruction of natural environment such as tropical rain forests and demanded that society take measures to protect this heritage (Leveque and Claude, 2003).

The sheer diversity of life is of inestimable value. It provides a foundation for the sustained healthy existence to both the planet and its creations. Biologists believe that ecosystem rich in diversity gain greater resilience and are therefore able to recover more readily from stresses.

Taxonomic assessment appears to be the very first task in the efforts of 'Biodiversity Conservation'. Precisely taxonomy acts as an index of biodiversity assessment.

2.1. ARTHROPODA: ARACHNIDA: ARANEAE

Arthropoda is the largest phyla of the Animal Kingdom, so far known by over 11,49,248 species (Osborn, 2010). About 59,000 species of arthropods are recorded from India (Anonymous, 2002).

Among the arthropods, the class Arachnida includes spiders, scorpions, pseudoscorpions, mites etc. As such arachnids of the world are known by 1,02,248 species (Osborn, 2010).

2.2. SPIDERS – THE FOCAL GROUP FOR TAXONOMIC EVALUATION

Should spiders be identified as a focal group for inventorisation? The reply is 'a must'. The reasons to such a reply are many fold. They are abundant and diverse in many terrestrial systems; taxonomically rich at species, genus and family levels. Spiders, composing the order Araneae are the largest group among arachnids. The current world list of spiders includes 41,719 species under 3802 genera distributed over 109 families (Platnick, 2010). They, in India are represented by 1520 species belonging to 377 genera of 60 families (Sebastian & Peter, 2009). All such spider families are recognized under two suborders – i) Mygalomorphae (primitive spiders) and ii) Araneomorphae (modern spiders).

The spiders are characterized by two main body parts, viz cephalothorax and abdomen, joined by a narrow pedicel, 4 pairs of jointed legs, 6-8 simple eyes and 4-6 spinnerets.

Spiders enjoy a wide variety of habitats. Members of the family Araneidae, Linyphiidae, Nephilidae, Tetragnathidae, Theridiidae and Uloboridae are found on the webs of their own. Some live in or on the ground either making the tunnels or holdings in natural cavities and depressions (theraphosids and some lycosids). Many of the corinnids, ctenids, lycosids, miturgids and some oxyopids and salticids run about over the ground and are usually found under logs and stones, forest litters, in meadows, under loose rock formations. Some do not spin web (Oxyopidae, Philodromidae, Salticidae, Sparassidae, Scytodidae, Thomisidae) and are found in the bushes, shrubs, herbs etc.
2.3. SPIDERS: THEIR BIOLOGICAL ROLE

Spiders are identified as effective predators of herbivorous insect pests. They can exert considerable top-down control, often catching more insects than they actually consume. They exhibit the ability to both lower and stabilize pest population making them excellent biological pest management candidates (Nyffeler et. al. 1994, Suderland et. al. 1999; Maloney et. al., 2003).

Their silk now a days are used to make a diverse range of items like – bullet proof clothing, parachutes, surgical threads, artificial tendons, biodegradable bottles etc. (Vollrath & Knight, 2001; Hinman et. al., 2003).

Spider venom equally is now being scanned for the development of pesticides. This is because of the neurotoxins present in the venom. Use of such neurotoxins can bring about control of several insect pests like Helicoperva armigera a serious cotton pest (King et. al., 2002). Likewise active protein components like, GSMtx4 is now being used as a potential life saving drug that prevents atrial fibrillation during cardiac failure. Another protein HF7 has lead to the development of a drug that is supposed to limit brain damage of stroke victims (Escoubas et. al., 2000; Hodgson & Rash, 2002; Bode et. al., 2002; Corzo & Escoubas, 2003).

They are also used in Homeopathic medicines (viz. Aranea Diadema, Latrodectus Mactans, Latrodectus Hasselti, Tarentula Hispania, Lycosa Tarentula etc.) where tinctures are prepared by putting the living spiders into absolute alcohol (Boericke, 1999; Clarke, 2002).

They are often utilized as bioindicators for evaluating the impact of anthropogenic disturbances on natural ecosystems (Maelfait & Hendrickx, 1997; Hore & Uniyal, 2008).

Above prompts to study the taxonomy of the spiders including their distributions which appears imperative in order to develop a complete database of beneficial/harmful spiders. It is supposed that the tropical rainforests are the abode of species richness. Contrarily, such forest ecosystems at least in West Bengal are yet to be explored in terms of biodiversity assessment, their conservation and utilization of the bioresource elements. It has also been agreed that intensive exploration in a smaller area would yield a better result as compared to larger area.

2.4. STUDY AREA

The forests fall under the biogeographic province 7B Lower Gangetic Plain.

Gorumara National Park (Pl. I & II)

Gorumara National Park is situated in the submontane terai belt of the Eastern Himalayas. The park is on the floodplains of Murti and Raidak rivers of Dooars, Jalpaiguri, West Bengal.

The forest is between the latitudes 26°42’N & 26°7’N and longitudes of 88°48’E & 88°8’E. The Government of India identified the forest as a National Park in 1994 with an area of 79.99 sq. km. The National Park is under the administrative control of the Divisional Forest Officer, Wildlife Division II (H.Q. Jalpaiguri). The forest area is distributed over two ranges namely South Range (H.Q. Lataguri) and North Range (H.Q. Chalsa).

It has a great diversity of floral assemblage mainly terai grassland interspersed with riverine forests, dry mixed forests, wet mixed forests and sal forests. Flood plains of
Jaldhaka and Murti include tall riparian grassland of *Phragmitis*, *Alpinia*, *Typha* etc. Highlands contain almost pure crop of sal with admixture of bahera, odal, jaman, lali, etc. Low line riverine forest is composed semul, siris, khair, etc. The forest is equally rich in orchids.

The park has approximately 50 species of mammals, 193 species of birds, 22 species of reptiles, 7 species of fishes and other micro and macro fauna. These include Indian one horned rhinoceros, Indian elephant, gaur (Indian bison), leopard, Malayan giant squirrel, wild pig, sambar, barking deer, hog deer etc. The park also harbours a rich plethora of arthropods (Anonymous 1996a, Anonymous 2005).

**Chapramari WildLife Sanctuary (Pl. I & III)**

Chapramari WildLife Sanctuary (under the administrative control of the Divisional Forest Officer, Wildlife Division II) located little north to Gorumara National Park is comprised of 9.6 sq. km. forest area. The Government of India declared it as Wildlife Sanctuary in 1976. On one side of it there is the Neora river and on the other Bamni and Murti rivers.

It consists primarily of dry mixed forest with a small patch of pure and mature sal. Main species are *Aphanamixis, Polystachia, Turpinia, Pomifera, Terminalia beferica, Machilus* spp., *Mallatus* spp. etc.

Elephant, gaur, wild pig, sambar, barking deer, leopard, tiger, rhesus macaque are common animals. There is a large congregation of birds. The sanctuary is also rich in arthropods (Anonymous, 1996a).

**Mahananda WildLife Sanctuary (Pl. I, IV & V)**

This sanctuary is situated in the terai region of Eastern Himalayas, on the west bank of river Teesta, lying between latitudes 26°55'33"N & 26°47'54"N and longitudes 88°33'31"E & 88°23'36"E. The notified area of the sanctuary is 129.04 sq. km. The forest was declared as Mahananda Wildlife Sanctuary in 1976, under the administrative control of the Divisional Forest Officer, Wildlife Division I (H.Q. Darjeeling). The forest is distributed over 4 ranges namely Sukhna Range (H.Q. Sukhna), West Range (H.Q. Sukhna), South Range (H.Q. 7th mile) and North Range (H.Q. 10th mile) (Anonymous 1996a, Anonymous 1996b).

Roughly 60% of the forest falls in the hilly region and remaining 40% in the plains. In the plains the forest subtypes include riverine to sal forests; khair, sisoo, simul, siris occur in the former while sal is the dominant species in the latter with admixture of lali, udal, bahera, asan, toon, etc. The lower hill forests extend to 800m and are of dry or wet mixed forests. Main species are panisaj, gamar, toon, dhobinut, choya bamboo, gokul, tejpat etc. Tree ferns and epiphytes are common.

Major fauna of the forest include gaur, leopard, tiger, elephant, spotted deer, sambar, common mongoose, wild pig, common hare, Assamese macaque etc. A rich varied population of reptiles, birds, fishes and arthropods are found in the sanctuary.
Table 1: Synoptic attributes of Gorumara National Park, Chapramari WildLife Sanctuary and Mahananda WildLife Sanctuary

<table>
<thead>
<tr>
<th>Reserve Forests</th>
<th>Ranges</th>
<th>Beats</th>
<th>Climate</th>
<th>Water Resources</th>
<th>Forest Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td>Khunia, Murti</td>
<td>Humidity: 75%-95%</td>
<td>Rain fall (Annual): 370-385cm</td>
<td></td>
</tr>
<tr>
<td>Chapramari WildLife Sanctuary</td>
<td></td>
<td></td>
<td>Temperature: Pre Monsoon-24°C-32°C, Monsoon-27°C-37°C, Post Monsoon-10°C-22°C</td>
<td>Neora, Banni, Murti</td>
<td>Terai grassland Dry mixed forests, wet mixed forests and Sal forests.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humidity: 75%-95%</td>
<td>Rain fall (Annual): 370-385cm</td>
<td></td>
</tr>
<tr>
<td>Mahananda WildLife Sanctuary</td>
<td>Sukhna</td>
<td>Chamta, Koklong, Mahanadi</td>
<td>Temperature: Pre Monsoon-25°C-33°C, Monsoon-27°C-37°C, Post Monsoon-10°C-20°C</td>
<td>Mahananda, Mahanadi, Teesta</td>
<td>Riverine forest and Sal forests</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>Gulma, Punding, Sukhna</td>
<td>Humidity: 75%-95%</td>
<td>Rain fall (Annual): 365-375cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>7th Mile, Laltong, Taribari</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>North</td>
<td>Kalijhora, Latpanchar, Sevok</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
PLATE I

Location of 3 Reserve Forests

Way to Gorumara National Park

Way to Chapramari WildLife Sanctuary

Way to Mahananda WildLife Sanctuary
PLATE V

Premonsoon

Monsoon

West Range

Sukhna Range

Postmonsoon

Sal plantation

West Range

Mahananda flowing through Punding

Koklong

Mahananda WLS

Sukhna

Postmonsoon

Mahananda WLS

Sukhna